UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

		Application No.	Applicant(s)
Office Action Summary		09/580,327	STEINBACH, RALF D.
		Examiner	Art Unit
		Luke S. Wassum	2177

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>05 November 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-11,13-21,23-28 and 30-43* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-11,13-21,23-28 and 30-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 May 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>9</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

Response to Amendment

1.   An Applicant's amendment, filed 5 November 2003, has been received, entered into the

record, and considered.

2.   As a result of the amendment, claims 1, 18, 32, 33 and 43 have been amended. Claims 5, 12,

22 and 29 have been previously canceled. Claims 1-4, 6-11, 13-21, 23-28 and 30-43 remain pending

in the application.

Information Disclosure Statement

3.   The Applicants' Information Disclosure Statement, filed 5 November 2003, has been

received and entered into the record. Since the Information Disclosure Statement complies with the

provisions of MPEP § 609, the references cited therein have been considered by the examiner. See

attached form PTO-1449.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in
> the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent
> by another filed in the United States before the invention by the applicant for patent, except that an international
> application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an
> application filed in the United States only if the international application designated the United States and was
> published under Article 21(2) of such treaty in the English language.

5.   Claims 1-3, 7-9, 13-16, 18-20, 24-26, 30, 32-34, 36-38, 41 and 43 are rejected under 35

U.S.C. 102(e) as being anticipated by **Mukhopadhyay et al.** (U.S. Patent 6,032,158).

6.   Regarding claim 1, **Mukhopadhyay et al.** teaches a system for retrieving data from a

database using a data management system as claimed, comprising:

> a) a change retrieval engine coupled to the database using a data management system and
>
> > operable to:
> >
> > > i) determine that data in the database managed by the data management system has
> > >
> > > been changed (see col. 3, line 67 through col. 4, line 2; see also col. 7, lines 32-
> > >
> > > 53);
> > >
> > > ii) receive information from the data management system identifying a particular
> > >
> > > business object with which the changed data is associated (see disclosure that
> > >
> > > the log transfer manager scans the server log and forwards the changes of the
> > >
> > > operational database to the capture process, col. 7, lines 35-46; see also builder
> > >
> > > process receives changes made to the source tables of the operational database,
> > >
> > > including information that identifies the business object modified [that is, the
> > >
> > > source table modified is received, and using the mapping information in the
> > >
> > > repository, the source table is mapped to a target table(s), said target table
> > >
> > > corresponding to and indicating the business object(s) embodied in the changed
> > >
> > > source table], and information that identifies the particular business object
> > >
> > > modified [that is, a key field identifying the source table record modified,
> > >
> > > information that is required for the builder process to later retrieve related
> > >
> > > data], see col. 7, lines 47-67; see also col. 8, line 59 through col. 9, line 30);

iii) access a data model specifying, for each of a plurality of business objects

maintained by the data management system, the plurality of business objects

including the particular business object, references to one or more tables

managed by the data management system that include data related to the

business object (see disclosure that the repository, analogous to the claimed

data model, contains mapping information relating to how data is to be mapped

and transformed from source tables of the operational database to target tables

of the data marts, col. 3, lines 47-56; see also col. 4, lines 9-12; see also col. 7,

lines 49-57 et seq., said target tables corresponding to and indicating the

business object(s) contained in the operational database, and for each business

object, identifying the corresponding source table(s) that contain data related to

the specific business object);

iv) identify according to the data model the tables specified for the particular business

object to identify data to be retrieved from the database using the data

management system according to the received information (see col. 4, lines 9-12

et seq.; see also disclosure at col. 10, lines 18-51, and also Figure 8, that the

mapping information of the repository contains references that link the source

table(s) that contains information related to a specific target table(s), said target

tables corresponding to and indicating the business object(s) contained in the

operational database);

v) request from the data management system the data to be retrieved included in the

tables identified according to the data model (see disclosure that the capture

process stages any changes made to the operational database in the dynamic

image tables, col. 7, lines 37-41; see also disclosure that the builder process

subsequently ensures that all related data is staged in the static image tables, and

if said related data is not present, it will be retrieved, col. 7, lines 49-57);

vi) receive the data from the data management system (see col. 7, lines 37-41 and lines

49-57 et seq.);

vii) store the data in the data log (see col. 7, lines 37-41 and lines 49-57 et seq., the

disclosed static and dynamic image tables of the change data capture (CDC)

database being analogous to the claimed data log); and

viii) communicate a transfer command (see disclosure that it is crucial that data

changes be propagated as quickly as possible, col. 2, lines 10-15; see also

disclosure that after data has been staged in the CDC database, the changes are

propagated to the target data marts via extract, transform and load process, col.

7, lines 65-67; see also col. 8, lines 9-18; see also disclosure that the data marts

are updated incrementally for critical real-time warehousing, col. 4, lines 13-16);

and

b) a change transfer engine coupled to the change retrieval engine and operable to:

i) receive the transfer command (see disclosure that it is crucial that data changes be

propagated as quickly as possible, col. 2, lines 10-15; see also disclosure that

after data has been staged in the CDC database, the changes are propagated to

the target data marts via extract, transform and load process, col. 7, lines 65-67;

see also col. 8, lines 9-18; see also disclosure that the data marts are updated

incrementally for critical real-time warehousing, col. 4, lines 13-16);

ii) obtain the data from the data log (see col. 4, lines 1-7 and 54-58, the CCDB/CDC

database being analogous to the claimed data log);

iii) communicate the data to an external system distinct from the data management

system (see col. 4, lines 13-15, data marts 206-209 being analogous to the

claimed external system).

7.   Regarding claim 18, **Mukhopadhyay et al.** teaches a method for retrieving data from a

database using a data management system as claimed, comprising:

a) determining that data in the database managed by the data management system has been

changed (see col. 3, line 67 through col. 4, line 2; see also col. 7, lines 32-53);

b) receiving information from the data management system identifying a particular business

object with which the changed data is associated (see disclosure that the log transfer

manager scans the server log and forwards the changes of the operational database to

the capture process, col. 7, lines 35-46; see also builder process receives changes made

to the source tables of the operational database, including information that identifies

the business object modified [that is, the source table modified is received, and using

the mapping information in the repository, the source table is mapped to a target

table(s), said target table corresponding to and indicating the business object(s)

embodied in the changed source table], and information that identifies the particular

business object modified [that is, a key field identifying the source table record

modified, information that is required for the builder process to later retrieve related

data], see col. 7, lines 47-67; see also col. 8, line 59 through col. 9, line 30);

c) accessing a data model specifying, for each of a plurality of business objects maintained by

the data management system, the plurality of business objects including the particular

business object, references to one or more tables managed by the data management

system that include data related to the business object (see disclosure that the

repository, analogous to the claimed data model, contains mapping information

relating to how data is to be mapped and transformed from source tables of the

operational database to target tables of the data marts, col. 3, lines 47-56; see also col.

4, lines 9-12; see also col. 7, lines 49-57 et seq., said target tables corresponding to and

indicating the business object(s) contained in the operational database, and for each

business object, identifying the corresponding source table(s) that contain data related

to the specific business object);

d) identifying according to the data model the tables specified for the particular business

object to identify data to be retrieved from the database using the data management

system according to the received information (see col. 4, lines 9-12 et seq.; see also

disclosure at col. 10, lines 18-51, and also Figure 8, that the mapping information of

the repository contains references that link the source table(s) that contains

information related to a specific target table(s), said target tables corresponding to and

indicating the business object(s) contained in the operational database);

e) requesting from the data management system the data to be retrieved including the tables

identified according to the data model (see disclosure that the capture process stages

any changes made to the operational database in the dynamic image tables, col. 7, lines

37-41; see also disclosure that the builder process subsequently ensures that all related

data is staged in the static image tables, and if said related data is not present, it will be

retrieved, col. 7, lines 49-57); and

f) communicating the data to an external system distinct from the data management system

(see col. 4, lines 13-15, data marts 206-209 being analogous to the claimed external

system).

8.   Regarding claim 32, **Mukhopadhyay et al.** teaches a system for retrieving data from a

database using a data management system as claimed, comprising:

a) a database operable to store data (see col. 3, lines 41-47);

b) a data management system operable to access and change the data in the database (see col.

3, lines 41-47); and

c) a data access interface system operable to:

i) receive information from the data management system identifying a particular

business object with which the changed data is associated (see disclosure that

the log transfer manager scans the server log and forwards the changes of the

operational database to the capture process, col. 7, lines 35-46; see also builder

process receives changes made to the source tables of the operational database,

including information that identifies the business object modified [that is, the

source table modified is received, and using the mapping information in the

repository, the source table is mapped to a target table(s), said target table

corresponding to and indicating the business object(s) embodied in the changed

source table], and information that identifies the particular business object

modified [that is, a key field identifying the source table record modified,

information that is required for the builder process to later retrieve related

data], see col. 7, lines 47-67; see also col. 8, line 59 through col. 9, line 30);

ii) access a data model specifying, for each of a plurality of business objects

maintained by the data management system, the plurality of business objects

including the particular business object, references to one or more tables

managed by the data management system that include data related to the

business object (see disclosure that the repository, analogous to the claimed

data model, contains mapping information relating to how data is to be mapped

and transformed from source tables of the operational database to target tables

of the data marts, col. 3, lines 47-56; see also col. 4, lines 9-12; see also col. 7,

lines 49-57 et seq., said target tables corresponding to and indicating the

business object(s) contained in the operational database, and for each business

object, identifying the corresponding source table(s) that contain data related to

the specific business object);

iii) identify according to the data model the tables specified for the particular business

object to identify data to be retrieved from the database using the data

management system according to the received information (see col. 4, lines 9-12

et seq.; see also disclosure at col. 10, lines 18-51, and also Figure 8, that the

mapping information of the repository contains references that link the source

table(s) that contains information related to a specific target table(s), said target

tables corresponding to and indicating the business object(s) contained in the

operational database);

iv) request from the data management system the data to be retrieved included in the

tables identified according to the data model (see disclosure that the capture

process stages any changes made to the operational database in the dynamic

image tables, col. 7, lines 37-41; see also disclosure that the builder process

subsequently ensures that all related data is staged in the static image tables, and

if said related data is not present, it will be retrieved, col. 7, lines 49-57); and

v) communicate the data to an external system distinct from the data management

system (see col. 4, lines 13-15, data marts 206-209 being analogous to the

claimed external system).

9.   Regarding claim 33, **Mukhopadhyay et al.** teaches software for retrieving data from a
database using a data management system as claimed, the software being embodied in computer-
readable media and when executed operable to:

a) determine that data in the database managed by the data management system has been

changed (see col. 3, line 67 through col. 4, line 2; see also col. 7, lines 32-53);

b) receive information from the data management system identifying a particular business

object with which the changed data is associated (see disclosure that the log transfer

manager scans the server log and forwards the changes of the operational database to

the capture process, col. 7, lines 35-46; see also builder process receives changes made

to the source tables of the operational database, including information that identifies

the business object modified [that is, the source table modified is received, and using

the mapping information in the repository, the source table is mapped to a target

table(s), said target table corresponding to and indicating the business object(s)

embodied in the changed source table], and information that identifies the particular

business object modified [that is, a key field identifying the source table record

modified, information that is required for the builder process to later retrieve related

data], see col. 7, lines 47-67; see also col. 8, line 59 through col. 9, line 30);

c) access a data model specifying, for each of a plurality of business objects maintained by

the data management system, the plurality of business objects including the particular

business object, references to one or more tables managed by the data management

system that include data related to the business object (see disclosure that the

repository, analogous to the claimed data model, contains mapping information

relating to how data is to be mapped and transformed from source tables of the

operational database to target tables of the data marts, col. 3, lines 47-56; see also col.

4, lines 9-12; see also col. 7, lines 49-57 et seq., said target tables corresponding to and

indicating the business object(s) contained in the operational database, and for each

business object, identifying the corresponding source table(s) that contain data related

to the specific business object);

d) identify according to the data model the tables specified for the particular business object

to identify data to be retrieved from the database using the data management system

according to the received information (see col. 4, lines 9-12 et seq.; see also disclosure

at col. 10, lines 18-51, and also Figure 8, that the mapping information of the

repository contains references that link the source table(s) that contains information

related to a specific target table(s), said target tables corresponding to and indicating

the business object(s) contained in the operational database);

e) request from the data management system the data to be retrieved included in the tables

identified according to the data model (see disclosure that the capture process stages

any changes made to the operational database in the dynamic image tables, col. 7, lines

37-41; see also disclosure that the builder process subsequently ensures that all related

data is staged in the static image tables, and if said related data is not present, it will be

retrieved, col. 7, lines 49-57);

f) receive the requested data from the data management system (see col. 7, lines 37-41 and

lines 49-57 et seq.); and

g) communicate the received data to an external system distinct from the data management

system (see col. 4, lines 13-15, data marts 206-209 being analogous to the claimed

external system).

10.   Regarding claim 43, **Mukhopadhyay et al.** teaches a system for retrieving data from a

database using a data management system as claimed, comprising:

a) means for determining that data in the database managed by the data management system

has been changed (see col. 3, line 67 through col. 4, line 2; see also col. 7, lines 32-53);

b) means for receiving information from the data management system identifying a

particular business object with which the changed data is associated (see disclosure

that the log transfer manager scans the server log and forwards the changes of the

operational database to the capture process, col. 7, lines 35-46; see also builder process

receives changes made to the source tables of the operational database, including

information that identifies the business object modified [that is, the source table

modified is received, and using the mapping information in the repository, the source

table is mapped to a target table(s), said target table corresponding to and indicating

the business object(s) embodied in the changed source table], and information that

identifies the particular business object modified [that is, a key field identifying the

source table record modified, information that is required for the builder process to

later retrieve related data], see col. 7, lines 47-67; see also col. 8, line 59 through col. 9,

line 30);

c) means for accessing a data model specifying, for each of a plurality of business objects

maintained by the data management system, the plurality of business objects including

the particular business object, references to one or more tables managed by the data

management system that include data related to the business object (see disclosure

that the repository, analogous to the claimed data model, contains mapping

information relating to how data is to be mapped and transformed from source tables

of the operational database to target tables of the data marts, col. 3, lines 47-56; see

also col. 4, lines 9-12; see also col. 7, lines 49-57 et seq., said target tables

corresponding to and indicating the business object(s) contained in the operational

database, and for each business object, identifying the corresponding source table(s)

that contain data related to the specific business object);

d) means for identifying according to the data model the tables specified for the particular

business object to identify data to be retrieved from the database using the data

management system according to the received information (see col. 4, lines 9-12 et

seq.; see also disclosure at col. 10, lines 18-51, and also Figure 8, that the mapping

information of the repository contains references that link the source table(s) that

contains information related to a specific target table(s), said target tables

corresponding to and indicating the business object(s) contained in the operational database);

e) means for requesting from the data management system the data to be retrieved included in the tables identified according to the data model (see disclosure that the capture process stages any changes made to the operational database in the dynamic image tables, col. 7, lines 37-41; see also disclosure that the builder process subsequently ensures that all related data is staged in the static image tables, and if said related data is not present, it will be retrieved, col. 7, lines 49-57);

f) means for receiving the requested data from the data management system (see col. 7, lines 37-41 and lines 49-57 et seq.); and

g) means for communicating the received data to an external system distinct from the data management system (see col. 4, lines 13-15, data marts 206-209 being analogous to the claimed external system).

11.   Regarding claims 2 and 19, **Mukhopadhyay et al.** additionally teaches a system and method wherein the data management system comprises an enterprise resource planning (ERP) system, and the external system comprises an external planning system (see disclosure that the system is used for various aspects of business, such as inventory control, payroll and billing, col. 3, lines 35-41; see also disclosure that the data mart, analogous to the claimed external system, contains a subset of corporate data for a single aspect of business, such as finance, sales, inventory or human resources, col. 1, lines 45-48. These disclosures illustrate the fact that the system of **Mukhopadhyay et al.** comprises an enterprise resource planning (ERP) system, and that the external system comprises an external planning system, as claimed.

12.   Regarding claims 3, 20 and 34, **Mukhopadhyay et al.** additionally teaches a system, method

and software wherein the change retrieval engine is further operable to monitor the data

management system to determine when a change document is created, the change document

indicating that data managed by the data management system has been changed (see disclosure that

the log transfer manager scans the server log and forwards changes of the operational database to

the capture process, col. 7, lines 34-37, the system log records being analogous to the claimed

change document).

13.   Regarding claims 7, 24 and 36, **Mukhopadhyay et al.** additionally teaches a system, method

and software wherein the business objects are identified in the data model by a name of a main table

of data associated with the business object in the data management system (see disclosure that data

is mapped from source tables to target tables identified by table names, col. 10, lines 18-51, said

target tables corresponding to and indicating the associated business object(s); see also Figure 8).

14.   Regarding claims 8, 25 and 37, **Mukhopadhyay et al.** additionally teaches a system, method

and software wherein the change retrieval engine is further operable to receive one or more key

values from the data management system, each key value identifying an instance of the particular

business object for which data was changed (see disclosure that when data in a source table changes,

the changes are staged in the corresponding dynamic image table, col. 7, lines 35-46; see also

disclosure that the dynamic image table is identical to the source table, thus including any key values,

col. 5, line 62 through col. 6, line 9).

15.   Regarding claims 9, 26 and 38, **Mukhopadhyay et al.** additionally teaches a system, method

and software wherein the change retrieval engine is further operable to request data from the tables

that are associated with one or more instances of the particular business object, the instances of the

particular business object identified by one or more key values from the data management system

(see disclosure that when data in a source table changes, the changes are staged in the corresponding

dynamic image table, col. 7, lines 35-46; see also disclosure that the dynamic image table is identical

to the source table, thus including any key values, col. 5, line 62 through col. 6, line 9; see also

disclosure that when committed data changes have been staged in the dynamic image table, the

builder process retrieves any related data from the operational database and stages it in the static

image table, col. 7, lines 49-57 et seq.).

16.   Regarding claims 13 and 41, **Mukhopadhyay et al.** additionally teaches a system and

software wherein the change retrieval engine is further operable to access the distribution model to

determine one or more serialization groups into which the data identified by the data model is to be

divided, and store the data received from the data management system in the data log according to

the serialization groups (see disclosure that the repository keeps track of mapping information for

how data is to be mapped from target tables of the operational databases to target tables of the data

marts, said data marts being analogous to the claimed external systems, col. 3, lines 47-52; see also

col. 4, lines 2-7; see also disclosure of the use of transaction ids and log sequence numbers in

preserving the transaction order when changes are propagated to the data mart, analogous to the

claimed use of serialization groups, col. 5, lines 30-33; see also col. 6, lines 36-42).

17.   Regarding claim 30, **Mukhopadhyay et al.** additionally teaches a method wherein the

change retrieval engine is further operable to access the distribution model to determine one or

more serialization groups into which the data identified by the data model is to be divided, the

distribution model is accessed to determine destination information for one or more external

systems to which the serialization groups is to be communicated, and store the data received from

the data management system in the data log according to the serialization groups (see disclosure that

the repository keeps track of mapping information for how data is to be mapped from target tables

of the operational databases to target tables of the data marts, said data marts being analogous to the

claimed external systems, col. 3, lines 47-52; see also col. 4, lines 2-7; see also disclosure of the use of

transaction ids and log sequence numbers in preserving the transaction order when changes are

propagated to the data mart, analogous to the claimed use of serialization groups, col. 5, lines 30-33;

see also col. 6, lines 36-42; see also col. 9, lines 35-54).

18.   Regarding claim 14, **Mukhopadhyay et al.** additionally teaches a method wherein the

change retrieval engine is further operable to access the distribution model to determine destination

information for one or more external systems to which the data in the serialization groups is to be

communicated, and store the destination information for the one or more external systems with the

serialization groups in the data log (see disclosure that the repository keeps track of mapping

information for how data is to be mapped from target tables of the operational databases to target

tables of the data marts, said data marts being analogous to the claimed external systems, col. 3, lines

47-52; see also col. 4, lines 2-7; see also disclosure of the use of transaction ids and log sequence

numbers in preserving the transaction order when changes are propagated to the data mart,

analogous to the claimed use of serialization groups, col. 5, lines 30-33; see also col. 6, lines 36-42;

see also col. 9, lines 35-54; see also the disclosure that the mapping_id and target_id, analogous to

the claimed destination information, is stored with the serialization information in the data log, col.

9, lines 35-54).

19.   Regarding claim 15, **Mukhopadhyay et al.** additionally teaches a method wherein the

change transfer engine is further operable to communicate the serialization groups to the external

system identified by the destination information, the data in the serialization group communicated to

the associated external system in the order that the data in the database was changed (see disclosure

that the repository keeps track of mapping information for how data is to be mapped from target

tables of the operational databases to target tables of the data marts, said data marts being analogous

to the claimed external systems, col. 3, lines 47-52; see also col. 4, lines 2-7; see also disclosure of the

use of transaction ids and log sequence numbers in preserving the transaction order when changes

are propagated to the data mart, analogous to the claimed use of serialization groups, col. 5, lines 30-

33; see also col. 6, lines 36-42; see also col. 9, lines 35-54).

20.   Regarding claim 16, **Mukhopadhyay et al.** additionally teaches a method wherein the

change transfer engine is further operable to access the distribution model to determine destination

information for one or more external systems to which the data in the serialization groups is to be

communicated, and communicate to the associated external system in the order that the data in the

database was changed (see disclosure that the repository keeps track of mapping information for

how data is to be mapped from target tables of the operational databases to target tables of the data

marts, said data marts being analogous to the claimed external systems, col. 3, lines 47-52; see also

col. 4, lines 2-7; see also disclosure of the use of transaction ids and log sequence numbers in

preserving the transaction order when changes are propagated to the data mart, analogous to the

claimed use of serialization groups, col. 5, lines 30-33; see also col. 6, lines 36-42; see also col. 9, lines

35-54).

Claim Rejections - 35 USC § 103

21.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness

rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section
> 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the
> subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary
> skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

22.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966),

that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a)

are summarized as follows:

    1.   Determining the scope and contents of the prior art.
    2.   Ascertaining the differences between the prior art and the claims at issue.
    3.   Resolving the level of ordinary skill in the pertinent art.
    4.   Considering objective evidence present in the application indicating obviousness or
            nonobviousness.

23.   Claims 4, 21 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Mukhopadhyay et al. (U.S. Patent 6,032,158) as applied to claims 1-3, 7-9, 13-16, 18-20, 24-26, 30,

32-34, 36-38, 41 and 43 above, and further in view of **Gerard et al.** (U.S. Patent 6,192,368).

24.   Regarding claims 4, 21 and 35, **Mukhopadhyay et al.** teaches a system, method and software substantially as claimed.

   Mukhopadhyay et al. does not explicitly teach a system, method and software wherein the data management system sends messages to indicate when data has been changed.

   Gerard et al., however teaches a system wherein system, method and software wherein the data management system sends messages to indicate when data has been changed (see col. 6, line 66 through col. 7, line 5).

   It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references, since they are both in the same field of endeavor, that is, the replication of data changes (see **Mukhopadhyay et al.**, Abstract; see also **Gerard et al.**, Abstract).

   Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to notify interested processes when data of interest has changed, since this would save the process the need to monitor a log or file by periodically checking for the existence of new data, but instead can wait for the receipt of a notification on the occasion when data has been changed, thus providing the advantage of saving processing time.

25.   Claims 6, 10, 11, 23, 27, 28, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Mukhopadhyay et al.** (U.S. Patent 6,032,158) as applied to claims 1-3, 7-9, 13-16, 18-20, 24-26, 30, 32-34, 36-38, 41 and 43 above, and further in view of **Zamanian et al.** (U.S. Patent 6,339,775).

26.   Regarding claims 6 and 23, **Mukhopadhyay et al.** teaches a system and method substantially as claimed.

Mukhopadhyay et al. does not explicitly teach a system and method wherein the business objects are identified in the data model by a business object name.

Zamanian et al., however teaches a system and method wherein the business objects are identified in the data model by a business object name (see col. 2, lines 65-67; see also col. 6, lines 55-58; see also the example wherein the business object is identified by object name tg_profits, at col. 8, lines 1-17 and in Figure 6; see also col. 14, lines 9-19 and Figure 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references, since the two are in the same field of endeavor, that is, a system for propagating data changes, as well as incorporating data transformations between the data source(s) and the data target(s) (see **Mukhopadhyay et al.**, Abstract; see also **Zamanian et al.**, Abstract).

Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to identify business objects by the business object name, since in the object oriented programming environment, the object name would be necessary for accessing the specific object in the database.

27.   Regarding claims 10, 27 and 39, **Mukhopadhyay et al.** teaches a system, method and software substantially as claimed.

Mukhopadhyay et al. does not explicitly teach a system, method and software wherein the change retrieval engine is further operable to apply field reductions to the tables identified according to the data model, the field reductions indicating one or more fields of the tables containing desired data, and requesting from the data management system data from the fields indicated as containing desired data.

Zamanian et al., however, teaches a system, method and software wherein the change retrieval engine is further operable to apply field reductions to the tables identified according to the data model, the field reductions indicating one or more fields of the tables containing desired data, and requesting from the data management system data from the fields indicated as containing desired data (see description of the aggregator transformation, col. 10, lines 1-36, and particularly the designation of specific fields as either INOUT, IN or OUT, col. 10, lines 27-32; see also the specific example of the ag_prodprof aggregator 603 in Figure 6, and described at col. 6, line 64 through col. 7, line 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to allow field reductions, since the external system might not require all data available in a given source table (see Zamanian et al., col. 1, lines 33-51), and often the source system and the target system has conflicting formats, structures or configurations due to hardware, software or vendor differences (see Zamanian et al., col. 17, lines 4-19), thus necessitating field reduction to remove those data fields that are unnecessary or incompatible with the target system.

28.   Regarding claims 11, 28 and 40, **Mukhopadhyay et al.** teaches a system, method and software substantially as claimed.

Mukhopadhyay et al. does not explicitly teach a system, method and software wherein the change retrieval engine is further operable to apply field filters to the tables identified according to the data model, the field filters indicating the desired data in the tables, and requesting from the data management system data the desired data.

Zamanian et al., however, teaches a system, method and software wherein the change retrieval engine is further operable to apply field filters to the tables identified according to the data model, the field filters indicating the desired data in the tables, and requesting from the data management system data the desired data (see description of the Filter Transformation, col. 10, line 65 through col. 11, line 21).

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement field filters, since this would allow the system to filter the source data to remove extraneous or erroneous records before loading the data into the target system (see col. 1, lines 37-40), thus improving data integrity.

29.   Claims 17, 31 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Mukhopadhyay et al.** (U.S. Patent 6,032,158) as applied to claims 1-3, 7-9, 13-16, 18-20, 24-26, 30, 32-34, 36-38, 41 and 43 above, and further in view of **Chang et al.** (U.S. Patent 6,308,178).

30.   Regarding claims 17, 31 and 42, **Mukhopadhyay et al.** teaches a system, method and software for retrieving data substantially as claimed.

Mukhopadhyay et al. does not explicitly teach a system, method and software for retrieving data wherein an error log is created if the data is not communicated to the external system, and data associated with the error is communicated to the external system before communicating additional data.

Chang et al., however, teaches a system, method and software for retrieving data wherein an error log is created if the data is not communicated to the external system, and data associated with the error is communicated to the external system before communicating additional data (see discussion of the validator, col. 9, lines 26-40).

It would have been obvious to one of ordinary skill in the art at the time of the invention to communicate errors in transmission to the external system, since this would allow the external system to take some remedial action to resynchronize the data between the two systems, and furthermore because in the absence of such a message the external system would be out of sync with the server, and would have the potential to present erroneous data to a user.

Response to Arguments

31.   Applicant's arguments filed 5 November 2003 have been fully considered but are not persuasive.

32.   The Applicant argues that the **Mukhopadhyay et al.** reference fails to disclose an engine

operable to access a data model specifying, for each of a plurality of business objects maintained by

the data management system, references to one or more tables managed by the data management

system that include data related to the business object".

33.   Regarding this argument, the examiner respectfully responds that the Applicant may have

misinterpreted the rejection of record.

The claim contains a data model specifying references to one or more tables that include

data related to a business object. Many business objects may be included, each having its own data

model.

The **Mukhopadhyay et al.** reference teaches a repository which contains mapping info (col.

4, lines 7-12). This mapping info specifies which source table(s) in the operational database

corresponds to which target table(s) in the data mart. The Applicant argues that the claimed

business objects exist in the (local) data management system, but **Mukhopadhyay et al.** teaches

business objects that exist in the (external) data mart.

The examiner responds that the business objects are *analogous to* the target tables in the

external data mart, not that the business objects actually exist in the target tables. For example, as

disclosed at col. 10, lines 18-65, and illustrated in Figure 8, a target table ITEMS exists in the

external data mart. This target table *would be analogous to* a business object which is *defined* in the

repository (comprising mapping information, col. 4, lines 6-12), and which *exists* in the (local)

operational database, comprising a single source table ITEMS.

Another example from Figure 8 is the target table SALES REVENUE, which is *analogous to* a

business object SALES REVENUE, which is *defined* in the repository, and which *exists* in the (local)

operational database, comprising the source tables ITEMS, PRICES, and QUANTITY SOLD.

The business objects actually reside in the operational database (which contains raw data),

but they *correspond* to tables in the (external) data mart. This should be no surprise, since the data

mart is designed to present a more 'finished' view of the raw data, a view that will be readily and

easily understood by a business analyst, and is useful for decision support (col. 1, lines 31-50). While

the Applicant has interpreted the rejection of record as meaning that the business objects actually

reside in the (external) data mart, this is not the case. Instead, each target table in the data mart

corresponds to a business object that is stored in the operational database, possibly spread across

multiple tables, with the mapping information of the repository serving to define which source

tables in the operational database make up each business object.

34.   The Applicant argues that the **Mukhopadhyay et al.** reference fails to disclose an engine

operable to "receive information from the data management system identifying a particular business

object with which the changed data is associated".

35.   Regarding this argument, the examiner respectfully responds that **Mukhopadhyay et al.**

discloses that data changes are captured and propagated to the data mart. This process necessarily

requires the receipt of information identifying a particular business object. For instance, the source

table that is modified identifies the business object that has been modified, as defined in the

mapping information of the repository (col. 4, lines 39-57). The source table modified corresponds

to a primary source table defined in the mapping information, and also to target table(s) (analogous to business object(s), as discussed above).

As for identifying a *particular* business object, this information is necessarily transmitted, since without this information it would be impossible for the system to propagate the change to the correct record within the data mart.

Specifically, the builder process receives the identifying information and then retrieves the data corresponding to the changed business object (see col. 7, lines 47-67, and also col. 8, line 59 through col. 9, line 30).

36. Since the examiner believes that the specific wording of the rejections of record could have been more explicit, this Office action is non-final, and the Applicant may reconsider the more explicitly stated rejections and make such responses and/or amendments as necessary.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Luke S. Wassum whose telephone number is 703-305-5706. The examiner can

normally be reached on Monday-Friday 8:30-5:30, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

John E. Breene can be reached on 703-305-9790. The fax phone number for the organization

where this application or proceeding is assigned is 703-872-9306.

In addition, INFORMAL or DRAFT communications may be faxed directly to the examiner

at 703-746-5658.

Customer Service for Tech Center 2100 can be reached during regular business hours at

(703) 306-5631, or fax (703) 746-7240.

Information regarding the status of an application may be obtained from the Patent

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see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system,

contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Luke S. Wassum
Art Unit 2177

lsw
1 April 2004